SCHOOL AND SOCIETY

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DECLARATION OF PRINCIPLES.[1]

THE committee on resolutions begs leave to present the following report for consideration and action as the message of this organization assembled in annual convention as an International Congress of Education, not only to the teachers and citizens of the United States, but also to teachers and citizens in all those countries which have, by their participation, contributed to the success of the Congress which is now about to close.

We appreciate the coming of the delegates and speakers from so many nations, and thank them heartily for their participation and words of wisdom and cheer. The messages relating to educational conditions and problems in different countries have recorded much recent progress in the expansion and perfecting of educational systems, and have revealed clearly the growth of an educational internationalism and a conception of world civilization among those engaged in educational work. The progress recorded has been important and significant, and promised much for the future.

On the other hand the virtual breakdown of civilization in Europe, which has taken place since the last meeting of this Association, has revealed to us how ineffective after all have been the systems of education upon which we have in the past placed so much dependence, insofar as the imparting of that type of education which would tend to preserve and advance the higher interests of civilization is concerned. In an age marked by so great an expansion of educational activities, such great industrial and commercial progress, such wonderful discoveries and advances in the application of science, and such progress in advancing the social welfare, we see nations heretofore devoted to the arts of peace and the advancement of civilization, almost at once, lapse into a barbarism which we a year ago would not have believed possible. Not only have the systems of education of Europe proved disappointing at the time of supreme test, but we can not console ourselves that the results would have been markedly different with us had this nation become engaged in such a titanic struggle.

Perhaps no greater work lies ahead of the school, in all lands and nations, than that of setting to work in an earnest endeavor to build up a more enduring type of civilization. We have made great progress in industry, commerce, and scientific work, but little as yet in establishing justice, good will, and the reign of law among nations. Our instruction, aside from those fundamental tool subjects which underlie all educational work, has been based upon too narrow an outlook. Nationalism has been pushed to the front and emphasized, rather than international justice and good will. The heroes of each nation's history have been those who have done the greatest injury to other nations and who have killed the greatest number of foreigners, rather than those who have conferred the greatest benefits on mankind. Our geography has related too much to the position, growth,

[1] Adopted by the National Education Association, Oakland, August 27, 1915.

and commercial progress of our own nation, and too little to our relations with other peoples. Our patriotism has been too much concerned with our rights, and too little with our obligations; too much with securing advantages for ourselves, and too little with the extension of international justice and good will. There has been too much talk in all nations of "national honor" and "rallying to the defense of the flag" and too little of national obligations and responsibilities. The discipline of our schools has been too much the discipline of the intellect and the body, untempered by larger conceptions as to justice and good will among men.

The people of each and every nation need to sink their nationalism in a larger internationalism, and to learn and teach the true place of their country among the nations of the earth. The task would not be so difficult if once it were resolutely undertaken. The people of different nationalities do not by nature hate one another, and many illustrations of international friendliness manifest themselves at any opportunity. The masses of the people do not want war, but peace. International hatreds are kept up by the governing classes and those who profit by such hatreds, and the basis for national jingoism and future international strife is continually implanted in the minds of the rising generation in the schools of the different nations. In most nations to-day the schools are deliberately used by those in authority to instill into the minds of the young an exaggerated nationalism, which can be touched off into international hatred at such moment as the governing authorities may desire.

Perhaps the greatest task which lies ahead of the school, in all lands and countries, is that of bending its energies toward the creation of a new order of international friendship, justice, and good will. Upon the public educational systems of each state and nation lies the responsibility of enlarging the national conceptions and promoting good will among the nations of the earth. Entirely new values and standards for judging need to be created among the different peoples. In particular the school histories need to be rewritten, and the teaching in history and geography in the schools needs to be entirely redirected. The emphasis now placed on the deeds of the soldier should be shifted to those who have created the best of our civilization and rendered the most lasting benefits on mankind. The emphasis now placed on wars should be shifted to the gains to civilization made in the intervals between wars, and war should be shown in its true light as a destroyer of what civilization creates. The biologic, economic, and human waste of war should be emphasized, and the fact that war is the breakdown of law and order and civilized society should be made clear to the young. Upon those who teach, but especially upon those who organize and administer education, rests the responsibility of creating a new national life in all countries,—a national life which shall prize the fruits of civilization, which shall honor most those who advance the larger interests of mankind, and which believes in international justice and good will and looks to friendly arbitration rather than to brute force to settle the difficulties which may arise between nations. The shaping of a new international policy among nations, looking ultimately toward international peace and good will and the preservation of the slow gains of civilization, calls for educational statesmanship of a high order, and will require time for its accomplishment, but such represents the greatest constructive task now before those who direct the work of instruction in every nation.

If the work of this International Congress on Education will in any material way contribute to the inauguration of a movement looking toward a reorganization and redirection of the instruction given in history and geography, and a broadening of the work in civics and morals; to the teaching of a new conception of friendship between nations; to the subordination of that love of dominion, still so prominent among nations, to a new conception of national rights and international justice; to the substitution of international tribunals and the reign of law and order for the present appeal to brute force and so-called national honor; to the development of an international patriotism based on the preservation rather than the destruction of the fruits of civilization; to an elimination of the lust for fighting and the love of military display among all people; to the erection of new standards for estimating the value of human service; and will help to spread the conception of the world interests, world civilization, world statesmanship and world friendship and good will, in place of the present narrow nationalism in all of these respects—it will have done much to hasten the day when the great human and economic waste of war, with its accompanying international hatreds, shall have been replaced by international law and order and good will, and when the gains and larger possibilities of civilization will not periodically be destroyed by the lapses into barbarism of a portion of mankind.

Of all the institutions working for the unification of mankind and the improvement of the social welfare the school stands first, and, in consequence, the importance of the stand to be taken by those who direct public education and those who teach in the schools can hardly be overestimated. What our civilization will be a quarter of a century hence will depend very largely upon the attitude assumed toward these new questions of international relationships by those who are responsible for the direction of public education in all lands and nations.

The National Education Association therefore desires to put itself on record as follows:

1. The Association looks upon the war now ravaging the continent of Europe as a tragedy having no parallel in history. This war is working havoc among the best racial elements in all nations concerned, exhausting the near future, bringing impoverishment to the race, and throwing an intolerable burden of sorrow and misery on women and children. The Association expresses the fervent hope that the measures adopted at the peace settlement conference will be founded on justice, and will thereby break down militarism and free the world from the fear of another calamity like the present. The Association heartily endorses the policy of the President of the United States concerning both the European and the Mexican situations. It rejoices in his eminent services to the cause of peace, which is the cause of law. To the President of the United States is primarily due the fact that this republic has remained law-abiding, despite currents of fear, hate, and excitement, and stands firm on the only basis on which civilization can be restored or peace maintained—the foundation of law.

2. The Association reaffirms its approval of the American School Peace League, the organization of peace leagues among pupils, the observance of Peace Day, May 18, and the dissemination of literature bearing on international relations. The Association views with satisfaction the efforts made by the American School Peace League to secure the cooperation of teachers in other countries, and hopes that in the future, similar

school peace leagues may become active forces in the educational systems of the different countries of the world.

3. The Association deplores any attempt to militarize this country. It again declares against the establishment of compulsory military training in the schools, on the ground that this is reactionary, and inconsistent with American ideals and standards. The Association expresses its approval of the policy of the Boy Scouts of America in keeping their useful work free from connection with military affairs.

4. The Association believes that the promotion of international relationships in education, science, art, industry, and social service is of fundamental importance, and that these can best be worked out by a coordination of the organized forces of the civilized world. To this end, international associations should have affiliated national organizations, in each case with a central body having delegates from each affiliated nation. In the interest of permanent peace and of world research a reorganization of international organizations should follow the establishment of peace in Europe. The United States, with other neutral nations, has a great duty to perform in this work of reorganization.

5. The Association feels that we have reached a time when interdependence and mutual understanding should create their proper organs of expression through permanent officials whose duty would be to report to their home governments on the work and progress of constructive social agencies in the country of residence. The presence of military and naval attachés in all embassies and legations emphasizes the least desirable of factors of international relations.

The Association believes that the constructive side of relations among nations should be emphasized, and recommends that each of the national governments which have participated in this International Congress on Education should be urged to appoint educational attachés as well to their legations and embassies in foreign countries.

6. The National Education Association congratulates the Panama-Pacific International Exposition on having made the official series of congresses the central feature of the exposition. The 852 congresses and conferences meeting during the exposition period will leave a definite impress on national and world progress. It is a matter for congratulation that education, with 129 distinctive congresses and conferences, has been made the most prominent feature of this great series of meetings.

In the interest of world harmony, we believe the splendid work of the Department of Congresses of the Panama-Pacific International Exposition should in some form be continued as a useful means of securing a concert of action among the nations and international associations.

In addition to the foregoing, relating to the promotion of international peace and good will and the ultimate substitution of law and order for brute force—a new task before teachers and those who direct public education, and one which to this Association seems to be by far the most important matter brought before this International Congress—this Association further desires to direct attention to a few of the larger and more significant movements now under way in this country, and which look toward the improvement of public education with us.

1. *Child Welfare.*—Most prominent of these, perhaps, is that recent and important movement for the promotion of child welfare, which embraces all movements tending to improve conditions surrounding the morals, health, and proper development

of children. Like the question of world peace and international justice and good will, the conservation of child life is certain to appeal to all humanitarian people. Within the past two decades almost all civilized countries have become interested in this movement—one which embraces infant care, child labor, the protection of the child from injurious and contaminating influences, health supervision and instruction in schools, preventative hygiene, playground activities, and the treatment of the child in accordance with the laws of his mental and physiological development. Any system of public instruction which neglects the physical and moral welfare of children and confines itself to their mental training is certain to prove inadequate to meet the needs of either the individual or society. This Association therefore expresses the hope that both the teachers and the parents of the nation may interest themselves in and study the different movements looking toward the conservation and improvement of child life.

2. *Rural Education.*—Perhaps next in importance, and in a way closely akin to the problem of child welfare, is the great problem of rural education and rural welfare which surrounds and affects the lives of almost half of the people of this nation. The solution of this problem demands such a redirection and reorganization of rural education as will enable both rural and village schools to contribute much more than they now do toward the improvement of the life of the people tributary to them. A great opportunity for a new type of service awaits the normal schools of this country, if they will but seriously turn their attention to the many important problems surrounding rural life, and train teachers definitely for helpful constructive service among rural people. Large opportunities for service also await those institutions which engage in agricultural extension and the promotion of the various forms of agricultural and home economics work among rural boys and girls.

3. *School Supervision.*—The movement for the training of supervisory officers, as distinct from teachers, which has recently been begun by our universities, colleges, and larger normal schools, is a movement of fundamental importance for the future of public education with us. The problems of organization, administration, and the supervision of instruction are now of such importance as to demand some special study, and this Association commends to educational institutions the establishment of such courses of instruction and to the states the creation of special supervisors' certificates, based on training and experience, and which, after a certain date, shall be required of all who propose to engage in supervisory service.

This Association also believes it to be a sound educational principle that wherever a teacher is at work or a child is in school, be it in city, town, or country district, that both teacher and child should have the benefit of close, personal, and professional supervision. The city teacher and child are now reasonably well cared for, but our present system of county supervision is, in most states, entirely inadequate to meet the new needs of rural and village education. We therefore express our belief that the present movement looking toward an improvement in our system of rural-school supervision, and the substitution of some larger administrative unit than the school district, is a movement which should meet with the approval of all. We also believe that, whatever the details of the system which may be eventually adopted, some adequate provision should be made for opening up rural-school supervision as a career for men and women—a career for

which either might be warranted in making thorough preparation, and which either might hope to enter wholly on a basis of merit.

4. *Teachers.*—Recognizing that in the last analysis the excellence of our public schools depends upon the teachers who do the actual work of instruction, this Association believes it of the highest importance that this work be done under the best possible conditions as to the promotion of good health, comfort, and peace of mind; to this end the Association expresses itself unequivocally in favor of adequate salaries, security of tenure, a suitable retirement annuity, and working conditions in which there shall be sufficient and helpful supervision, and at the same time freedom from arbitrary or needless restrictions or requirements, and from those "ratings" and records which unnecessarily disturb the teacher's peace and make the rendering of the best service impossible.

5. *Differentiations in Instruction.*—The different attempts which are now being made to differentiate instruction and adjust school work to meet individual needs, and to reorganize our educational work along new lines with a view to enabling our schools to meet better those special-group and individual needs which we have but recently come to recognize as important in public education, are movements which appeal to this Association as of large importance for the future of our educational work. It seems to this Association to be a thoroughly sound and just principle that every child of school age in a community should be provided with that kind of education which will be best adapted to meet his peculiar educational needs. The adoption of such an educational principle, however, calls for differentiations and adjustments in schools and in courses of instruction, and for a wide diversification in our school work. What our schools have heretofore achieved for the mass, they now need to set themselves to try to accomplish for groups within the mass. Different types of schools, different emphasis in instruction for different groups, a wide range of educational opportunities, and an estimation of equivalences based more upon needs and growth than upon similar accomplishments, will all be necessary. A material extension of the school day, a larger introduction of play and constructional activities, a wider use of school buildings, particularly with reference to adult education, Saturday instruction, and instruction in some form throughout the entire year, will also be necessary to the accomplishment of such an enlarged educational purpose.

6. *Enlarged Scope and Funds.*—With us, education represents one of our greatest national interests, and in no other country in the world have the results of a system of public instruction shown forth to better advantage in the general intelligence, poise, good judgment, and productive capacity of the people. This Association, however, desires to call to the attention of our people the fact that what has met the needs in the past will not suffice for the future, and that each of the important educational movements so far mentioned can mean nothing less than a further enlargement of the work and function of the school as the constructive instrument of democracy. Each enlargement of function in turn demands increased funds, and, if our schools are to render the service expected of them, our people must be prepared to give to those responsible for the conduct of public education a larger and a larger proportion of public funds. The time is coming, perhaps in the very near future, when the enlarged scope of public instruction will probably

demand one half of the taxes paid by our people.

7. *Cooperation of Other Agencies.*—We recognize with pleasure the increasing interest which citizens are displaying in the work of the public schools. We commend the action of a resident of California who made it possible for this Association to offer a prize to the person presenting the best essay on "The Essential Place of Religion in Education, with an Outline of a Plan for Introducing Religious Teaching into the Public Schools," and thus brought the attention of teachers and patrons to a vital question. We trust that the influence of the contest may be far-reaching in its after effects and that as a result, some method may be worked out by which the underlying principles of religion may be taught to our young people, realizing as we do that the home and the church are not covering the whole field. We also commend the action of the President of the Society for Thrift which enables this Association to offer prizes, during the coming year, for the best essays on subject of thrift with an outline of a plan by which it may be taught in the public schools. These are movements of large educational significance, and deserve further study and encouragement.

8. *United States Bureau of Education.*—In conclusion, this Association desires to express its appreciation of the cooperation extended to it in its work by the United States Bureau of Education.

This Bureau, considering the very meager appropriations made for its work, has recently begun to render a service in the cause of peace and education as important as its scope is limited. This Association desires, once more, to respectfully urge upon Congress that it very materially enlarge the appropriations for the maintenance of this Bureau, and that it do not longer delay placing the Bureau in a position where it can render a service to those engaged in the care and education of children, in all of the states, which shall be analogous to that which has for so long been rendered by the national government to those engaged in the care and propagation of fishes, hogs, cattle, and crops. An annual appropriation of not less than five hundred thousand dollars should be made at once to this Bureau, and this amount should be increased as fast as additional funds can be used to advantage.

Respectfully submitted,

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CHANGES IN ENGLISH EDUCATION SINCE 1900

I

MODERN England owes a great debt to other nations for educational stimulus. At an international congress, appropriate opportunity is given for gratefully acknowledging this debt. And in these days of trouble obligations should not be forgotten. On the contrary, we find solace and encouragement in remembering them—solace, because they remind us of happier days, encouragement, because they convince us that relationships of mutual service will hereafter be renewed.

To England from every one of her sister nations there has come an educational inspiration during the last twenty years. And what is true of this recent period in our history has also been true of each earlier period of critical transition in human outlook and ideals. Just as in the days of the Renaissance and of the Reformation, England felt the kindling power of for-

eign influence, so has she felt it in these latter days, about which I have been invited to make a communication to this congress. France and Italy, Belgium and Holland, the three Scandinavian kingdoms, have all exerted some characteristic influence upon English educational opinion and practise since 1900. But, apart from what we English owe to our fellow-countrymen within the United Kingdom and in the Overseas Dominions of the British Empire, our chief debt in the sphere of educational thought and administration has been to the United States of America and to the German Empire. It is hard to say which of the two has influenced us the more. Of the two, the American educational ideal is the more akin to our own. But the German has had for us, during recent years, a salutary message. And I am glad to find that in all that I have written about German education during the last twenty years, there is nothing that at this hour I would wish unsaid.

But, though it is possible to trace in the recent development of English education these marked currents of foreign influence, English schools and English teachers are very far from having been dominated by them. On the contrary, our English education has its own tough tradition, its own ingrained characteristics, its own flavor, and its own distinct purpose and duty in the work of the civilization of the world. My mind glows when I think of its high service to the ethical standards of the race, and of its power of renewing its youth in response to the changing needs and destiny of our people. It is conservative and yet open-minded; bound by ancient obligations and yet free in its acknowledgment of new duties; colored by the convictions of many different social groups; and yet sensitive to the claims of national unity. At its worst, it may be distracted by conflicting ideals and hampered by confused administration. But at its best (and its best is not rare) it is distinguished by a noble fairness of mind, by an inbred love of liberty, by obedience to conscientious conviction, and by a readiness to acknowledge the two sides of truth.

II

With us in England the last fifteen years have been years of educational revolution. The stream of change began to run strongly thirty years ago. But the current has run more swiftly since the present century began. This is not equally true of the other countries which are joined with England in the United Kingdom. My hearers are aware that English education is very different in its organization, and not less different in its traditions, from Scottish education, or Irish, or even from the Welsh. To-day my purpose is to speak of English education alone. And of English education it is true that the last fifteen years have been years of sweeping change and of an extraordinary ferment in opinion. Looking backward, we may conjecture that, in obedience to some deep instinct, England was putting her house in order, against the coming storm. Or perhaps the same forces of intellectual and moral unrest, which have issued in a world struggle, showed their presence in an upheaval in our educational thought and consequently in far-reaching changes in the fabric of our educational administration.

In this paper it would be out of place for me to enter into details. To give a minute account of the changes in English education since 1900 would need a volume. But it will better serve the purpose of this congress if I attempt to give in brief outline the salient features of the reconstruction which has been achieved.

Three great things have happened: (*a*)

The machinery of English educational government has been reconstructed. (*b*) A new conception of the service which education can render to the nation has been formed. And (*c*) the center of gravity in English educational purpose has changed. Allow me to take these three points in succession.

(*a*) Since 1900 the whole structure of educational administration in England has been remodelled. At the center, it has been unified. In the cities and counties it has been assimilated with the main fabric of local government and has been spread consistently over the whole country. Even in England itself, the significance of this change has hardly been realized. But its consequences already influence every family and touch every purse. The effort to carry out this stupendous reorganization has occupied the thoughts of our central and local administrators to such an extent that for a time, though only for a time, our educational energies have been absorbed to an excessive degree by problems of machinery. But the effort had to be made and has been carried through successfully and with surprisingly little disturbance in the national life. Year by year the results of our new educational administration will become more striking. The change has necessarily been accompanied by a great increase in the number of paid officials. But English education has not been bureaucratized. On the whole, it has kept itself free from the taint of arrogant officialdom, and, where it has been most human, it has been most serviceable and most successful. Its freedom from the stiffness of bureaucratic control has been due to the devoted, unremunerated service of thousands of men and women of good will and high disinterestedness. These servants of the public have carried over into the new system the best traditions of the older, and much less highly organized, English schools. And, in response to the closer organization of the administrative side of our education, the various groups which constitute the army of teachers have organized themselves more effectively than before, preserving in this way under the new conditions the teacher's moral freedom and independence of undesirable political restraints. This rapid movement of concentration among the various bodies of teachers has culminated in the establishment of a Teachers' Register and of a Teachers' Registration Council. The last-named body promises to become to the teaching profession what the Medical Council is to the doctors, namely the accredited organ of a semi-autonomous profession, recognized and to some extent regulated by the authority of the state. A supple organization, preserving group-autonomy within a framework of national unity, is the keynote of the English social changes of the day. Of that organization, a free but self-disciplined temper is a necessary presupposition. Such a temper must be fostered by the schools. In order that it may continue free, the schools and the teachers must have liberty. In order that it may be disciplined, the schools and the teachers must themselves submit to reasonable organization.

(*b*) Since 1900, English people have realized that education generously planned is a vital necessity to a modern state. The distinctive marks of English education, as compared with the systems of most other European states, have been its duplications and its freedom from state control. No other European country, except perhaps Russia, has so many alternative types of school and university as we have. English education is social in its fundamental purpose. And therefore, as England preserves a great variety of social ideals within the outer framework of its national life,

we have a corresponding complexity of schools, each attached to one or other of our social outlooks. Further, to a considerable degree, every type of school tends to produce a type of mind. This system is interwoven with our social history. It is deep-rooted in our past. It is what we prefer. It is the nursery of a certain kind of group-independence and of a certain kind of group-initiative. It is conservative. It maintains established codes of principle. But, on the other hand, it is very expensive. It involves intellectual waste. Nevertheless it is national, if by the word "nation" you mean an aggregate of groups united in the defence of certain fundamental necessities but free to develop infinite varieties of opinion and of preference. To link the different social groups, with their several educational institutions, into a unity of national organizations without destroying the elasticity of their varied life has been the aim of English educational statesmen during the last fifteen years. And because we were weak in our sense of the state, it is the national side of educational organization that they have emphasized. In response to their arguments and efforts, the English people have acquired a new feeling of the national duty of every type of school. Since the reign of Queen Elizabeth, England has never had so strong a national self-consciousness as she has to-day. And this new feeling of national duty is reflected in the schools. Once realize that education is a national thing and you find artificial barriers due to obsolete class distinctions intolerable. Free passage from the bottom to the top there must be for every boy and for every girl who has capacity to seize and profit by educational opportunity. This means schools everywhere, and everywhere passages of communication between grade and grade throughout the whole fabric of the school system. In so far as this easy communication can be established by administrative devices, it has been generously secured in English education by a liberal supply of scholarships, many of them carrying adequate allowances for maintenance. But in so far as this easy communication from top to bottom in the educational and economic life of the community depends upon psychological conditions, that is upon the customary way of looking at life and its opportunities for the energetic individual, all one can say is that in England the change in social outlook among the poor and the rich, among employers and employed, has been rapid during the last fifteen years, and has been profoundly influenced by American feeling and by the habit of mind which is general in the self-governing overseas dominions of the British Empire.

(*c*) Thirdly, the point of view of the administrator in regard to the essential purpose of education has shifted very noticeably since the century began. It has become more liberal, less mechanical, more humane. Into the schools of the people, the tradition of self-government is passing from the older schools of the wealthier classes. Arnold of Rugby is the educational hero of the English primary school teacher of to-day. Sir Robert Baden-Powell, founder of the Boy Scouts, is the Arnold of contemporary England. English educational administrators at the present time realize that healthy bodies are as a rule the accompaniment of healthy minds. The health service in our schools grows more important year by year. And for this we owe much to German example. But we cling, and cling rightly, to the ideal of the self-contained house as the most conducive to healthiness and solidarity of home life. In this, we are, in my judgment, wise. But the independence of the English home makes it a long business to introduce into family life the

new standards of personal hygiene which the school medical officer enforces by inspection and the school teacher encourages by instruction and example. Steadily, however, the significance of physical well-being, with all its consequences in housing reform and in changes in diet and ventilation, is dawning on the minds of the masses of the English people. A sense of the need for change in the hygienic conditions of our factory life and of industrial employment in England is one root cause of our labor unrest. The influence of our new education spreads the ferment of new ideals of life. And that ferment will in turn produce a further inevitable change in the Englishman's conception of the values and methods of education.

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WAY OF APPROACH TO THE SUPREME IDEAL IN SCHOOL EDUCATION

No intelligent observer of social development can have failed to realize that the last few years have seen the almost universal development of political, industrial, religious and other disintegrating forms of human unrest which are the historical preludes to great and vital changes in social structures. Among the elements of this world ferment of unrest and instability the ferment in education has not played the least or an unimportant part, and it is already evident that it will take a foremost place in the readjustments which will result. And this is not surprising, for what all such upheavals do spasmodically, and often with cruel violence, education does continuously and peaceably, *i. e.*, it shapes the destiny of man.

Again, these catastrophic movements are essentially due to the arising of and struggle after, new ideals, which may, or may not, be good in their nature and results. Hence, in considering the question of the supreme ideal in school education, we are actually dealing with one of the deepest of the world problems of to-day and all time. Indeed some of our leading thinkers have boldly asserted that the present war has been prepared for by the ideals incorporated in a certain system of national education, and that all future ideals in school education will have to take account of this fact. However this may be, we shall not be wrong in holding that the schools form the great man-shaping instrument of communities and nations, and, therefore, the ideals which govern them are of supreme and universal importance.

If it be granted that education has such a relation to national life, and, therefore, to world movements, as here suggested, then it is clear that not only is it necessary that a nation, as a whole, should be keenly and constantly interested in its schools, but that it should possess an enlightened and serious interest in them. Until this is the case, the best efforts of the scientific educationists will be largely sterile instead of fruitful for the public weal. Like nearly all great movements for the general good, efforts for progress in education need to be firmly rooted in the convictions of the mass of the people, and they must justify themselves by so raising the masses that they are fit and willing for further progress. That is to say, broadly speaking, efforts towards higher ideals in education must start from the man in the street and return to him, and according as he is wise in appreciating and selecting them, in such measure will progress be towards the best.

To get the greatest efficiency from a school system, it must be national; to be national its ideals must appeal to the average man; to appeal to the average man its ideals must be convincing and practicable; and to be convincing and practicable the

ideals must be based upon sound and exact knowledge, and formulated in language which can be understood by the people. Herein is involved the true relation of the educational experts to the schools, through the average man; and until this is clearly recognized and practically realized educational progress will be severely handicapped. We must harness the public to the philosopher's car, for education is a national interest, and most concerns the average man. The great duty, one may say, of the scientific educationists is to find the deepest and soundest truths for the educator; while the chief duty of the educational politician and administrator is to convince the general public of the high practical value of these, and the necessity of realizing them through the schools. The main purpose of this paper is to endeavor to suggest how this issue may be met.

Now it is quite obvious to the student of education that, throughout the ages, individuals, communities and nations have sought to achieve or perpetuate their ideals of life in and through their schools. It is in this way that the evil of training children as though they were miniature, or rather mimic, men and women has arisen. What we call classical education used the languages, ideals, philosophies, sciences, etc., of the wisest men of the classical ages in the endeavor to train the young, so as to produce what is held to be the best form of culture in adults. Religious communities similarly used the materials of their adult convictions in the schooling of their children, in order to perpetuate their own religious ideals. During the last century the British government had political economy and agriculture taught in the elementary schools, because it was thought that this would lead to the better civic behavior of the working classes, and the prevention or abolition of certain forms of industrial discontent. It failed, as it was bound to do, in that it required children to think as adults.

During the last few years there has been in England a growing public agitation which, based upon a vague feeling of discontent with the results of school education, is gradually assuming the form of a definite demand for some radical change in our schools. The "business man," *i. e.*, a man who has built up, or inherited a large and successful commercial or industrial establishment, and who does not seem to realize that conducting a school successfully is also largely of the nature of a highly specialized "business" undertaking —the business man finding that other nations are pressing Great Britain hardly in the world's markets, has been looking round for a remedy, and has decided that the schools are at fault. He forgets that it was such as he who, in 1870, decided that the national system of education should be such as to produce children who were thereby only, and very inadequately, fitted to be junior child clerks. The "business man" was then greatly in need of clerks, and he is now greatly in need of skilled artisans, and demands that the schools shall produce them.

The result of this movement has been that education is to-day, what it has never been before in England, an affair in which the man in the street concerns himself. Most of the leading daily newspapers in the country give a comparatively large amount of space and attention to education—the *Times* has published an educational supplement monthly during the last two years—and political and other public speakers enlarge on the matter. Unfortunately neither the man in the street, nor the newspaper writer, often knows much about the subject, and are much less often aware of their ignorance. An amazing example of this occurred in a leading London

daily paper, where a leader writer tried to make merry over the report of an eminent medical officer to an education committee, wherein he had pointed out that much would be gained by teaching phonography (shorthand) in schools. The leader writer remarked that to suggest the use of phonographs in schools was really carrying a joke too far.

But not only have the general public been actively concerning themselves as to school aims, but educationists and teachers have shown an unprecedented interest in the discussion of new ideals and ways of teaching. The use of handwork in schools has made very considerable strides; the writings and work of such men as Herbart, Stanley Hall, Dewey, etc., have led to reforms in school work; experimental pedagogy is fast becoming a living influence among the more enlightened and progressive teachers; and individual efforts in investigation and experiment are beginning to be made. The Montessori method has given rise to such keen public discussions, that queues of waiting people, overcrowded halls, and overflow meetings, have been frequent—things hitherto unknown in public meetings for educational discussion.

It is not surprising that in all this public and professional ferment there should be much breaking loose from ancient moorings, much unsettlement and unrest, and much anxious seeking for some solid foot of earth, so to say, upon which to rest the feet. Educational aims and ideals are in the melting pot, and there is likely to be a veritable chaos of conflicting suggestions and assertions. Every aggressive individual who is pleased to concern himself or herself with the subject seems to think that anybody who has been to school is competent both to judge the alleged disease and to prescribe a remedy—as though taking a pill qualified one to be a physician. Groups of parents, more or less manipulated by teachers, start schools to carry out their own views of what education should be; individual believers in some form of socialism or anarchy do the like; and even serious social workers and educationists associate themselves with individualistic and titled amateur enthusiasts in conducting summer courses, conferences and private schools, on the plea that the times are critical and that solutions of our difficulties must be found. All this is, of course, by no means without certain good results, and is mentioned mainly as evidence of the present condition in affairs of education.

If the above be true, or even only approximately true, to fact it is clear that never was there a time when clear and definite views on the highest ideals in education were more generally needed, and, therefore, no time more opportune for the consideration of the question whether a supreme ideal for school education can be helpfully formulated and applied.

Unless we can formulate and get the public to accept some clear and commanding ideal, the progress of education is likely to be spasmodic, unscientific and unsound. Hence the search for it is imperative and urgent, and we must seek until we find.

It will be noticed that the question is here limited to *school* education. There will in fact be two vital and limiting conditions which must be borne in mind throughout this paper, viz., first, that by school education is meant systematic education from the age of three, at the very earliest, to the age of sixteen; and, second, that by "supreme ideal" is meant, not a final or absolutely perfect ideal, but the best possible here and now, according to the best knowledge and means available. It is only by keeping our minds clear on these two points that we can hope to discuss the subject profitably. Once we depart from such

limitations, we are overwhelmed by a deluge of the most perplexing issues. For example, while it is true that, in its full and final meaning, education is coextensive with life from the cradle to the grave, and involves all the influences which can and do act upon the individual, yet, in the case of the child who is, and ought to be, in a state of tutelage, education is and must be, for all practical purpose, a vitally different thing from that of an adult who has come to years of discretion and is his own man. To talk, for example, of self-education in the case of a child of six in a Montessori school, and in the case of a man like the late Professor Blackie—who taught himself a foreign language, when over sixty years of age—without recognizing the fundamental difference between them, is to invite confusion in thought and action. But this is the historical mistake of the man in the street, and has been the source of endless errors in public education.

This and other fundamental differences between the education of an average child who can not and should not be allowed to try to—except in a tentative way, and to a limited extent—order his own life in any sound and safe way, and the average adult who should be reasonably able, and reasonably free, to do so, are generally ignored by writers on education, with the result that we get the perpetuation of the old fallacy, though it is in a new form, of treating children as adults who have not yet grown up. As examples of this we may mention: the requiring of originality, invention, self-expression, etc., in infants' schools; expecting children to take fully responsible parts in the establishment and conduct of communities organized on the lines of the ripest forms of adult evolution; letting school children take the lead in town improvements ("beautiful—" schemes); and requiring the young ones to fill their minds with the reasons for peace and against war. Again let it be said that certain forms of these things are not without their elements of good for children, but if Professor James was right when he said "I think I have seen college students unfitted forever for philosophy from having taken that subject up a year too soon" ("Talks to Teachers"), how much more likely is it that children may be similarly incapacitated for later life by our beginning the teaching of adult subjects to them from half a dozen to a dozen years too soon. Yet even progressive teachers who condemn such things as classical schools, cultivate them in the most modern schools.

But the most serious instance of the evils of the imposing of adult forms of development upon children is in the teaching of religions as a means of child culture. Let it be noted that the term "*religions*," and not *religion* is used, for these are very different things. Religions are particular philosophies of life, organized into systems of prescribed forms of faith and worship, while religion is, at least in the minds of most intelligent and thoughtful people, a basic element in any and every philosophy of life. It is impossible in the time at our disposal—and besides this paper only attempts to outline a problem and suggest possible lines of solution—fully to discuss so grave and disturbing an issue as this, notwithstanding that it is most urgently in need of full discussion. In England this issue has been the most constant and the most disastrous obstacle to national progress in education, and is so at the present moment. Two challenging criticisms must however be offered here, and these are: first, that it is quite unnecessary to settle the final issues of philosophies of life before going on with practical education—as a professor of education once remarked, "It really is not necessary to be a senior wrang-

ler in order to teach the multiplication tables''—and, second, that philosophies of life are not the concern of children as such.

This brings us to one fundamental element in any possible supreme ideal for school education, viz., that it must primarily and mainly be concerned with the actual interests of the children as such—understanding by ''interests'' those things which it desires and strives after instinctively because of the needs of its nature—and not with their possible interests when they become adults. This is a truth which in its more limited (and often wrongly interpreted) form of Educate through the child's instincts, has almost become a wearisome platitude, so frequently has it been asserted and expounded. But does not a careful testing of actual facts reveal that even this limited form of the truth is far more frequently ignored than observed in practise, even if and when it has been accepted in theory? At any rate the point is well worth a little reconsideration, for it is vital to our present purpose.

A second element obviously follows from the one just mentioned, viz., that the ideal should embrace all the substantial interests of the child, as such, for only by attending to all of these can we hope to get a reasonably complete development of his whole being, which is a complex, inter-related, and interdependent, unity. This takes us to the very heart of the matter, for if we can make clear to the average man what is the real nature of the child, and what, in consequence, are the inevitable limitations of sound education during school life, we shall not be likely to have much difficulty in getting him to accept a reasonable form of educational ideal.

Here, as in so many realms of thought, the scientific thinker will find his safest starting point in what is the almost universal usage with the average man: the regarding of human nature as a trinity in unity, *i. e.*, a human being is regarded as made up of body, mind and spirit. These three elements have formed, in effect, the accepted standpoints for educational thought and action from Plato and Aristotle to Dewey and Montessori, and only one of these elements has ever been the cause of any substantial difference as to its broad and general meaning, and that one is ''spirit.'' Around the meaning of this word have raged the most violent and incessant controversies and political struggles, *i. e.*, the contests over what is called ''religious education,'' but which, we contend, should be called instruction in religions. For our present purpose we shall return as nearly as may be to Plato and define the spiritual part of man as that part of him which concerns itself with deciding what is his highest destiny, and how best to order his conduct so that he may achieve it. Few people, will, we think, deny that this contains the very essence of the idea of religion, though it does not in the remotest degree commit one to any particular system of religion. It is the esthetical and ethical elements of humanity, which are always striving towards the beautiful and the good, and express their strivings and achievements through art and morals. We shall, therefore, speak of physical, intellectual and moral education.

It ought not to be difficult to convince the average man of to-day that, to get the best sort of men, we must educate, as wisely and completely as we can, children's physical, intellectual and moral powers. We say the ''average man of to-day'' because he is undoubtedly more competent to take a sane view of such matters than was the average man in the past; for he is an educated man and very much closer to, and in far more intelligent sym-

pathy with, the knowledge of the expert. In the past there has been a practical divorce between the philosopher and the public, and far more divergencies between philosophers themselves than to-day. These divergencies were mainly due to the fact that thinkers were chiefly concerned with exploring some one phase of education; while the divorce was due to the ignorance of the masses, and their preoccupation with material success.

Thus we find that among the thinkers, Plato was chiefly concerned with the place of the philosophy in education; Aristotle with that of science; Rousseau with that of nature; Pestalozzi with that of intuition; and so on. Meanwhile all the ordinary schools were concerned with making children acquainted with, and more or less facile in, the manipulation of the formal knowledge which those responsible for their schooling thought would be of the greatest use to them as adults: the Spartans trained their children to be soldiers, the Jesuits trained children mainly for the religious life; while the earliest general effort in school education in England was amongst the clergy and its aim was to train children to become priests, and a later general effort was designed to teach the children of the poor in such a way as to fit them for their station in life—in charity schools, and those on the Bell and Lancaster systems. But these different kinds of educational efforts have always more or less leavened each other, and have been constantly converging both in theory and method; and the time has come for showing that a complete reconciliation of their aims and practises is possible, because, whatever we may desire, only certain things are possible in the education of children, and by the fullest and best realization of these, all other aims can be more easily and fully realized.

Here again we ought to find it easy to demonstrate to the plain man that in the measure in which we are successful in developing all the child's chief physical, intellectual and moral powers to their fullest and best forms during childhood—and this is the supreme ideal of school education—in this measure he has been best prepared for developing himself as a good churchman, citizen, artisan, etc. Then, and not till then, is it likely that the true sense of responsibility for education will be found, where it ought to be found, in the mind and heart of each and every citizen.

But the public will, very properly, demand to know something of the details of what is involved in "developing all the child's chief physical, intellectual and moral powers to their fullest and best forms during childhood." To decide these details we must call in the anthropologists, biologists, physiologists and psychologists, and ask them to give us the greatest possible amount of information as to the best that is known thereon, so far as this can be said to be generally approved amongst the best authorities; and we must ask the scientific pedagogist and practical educator to show us the best methods and means for realizing what is involved. In these matters the public must be prepared to leave themselves in the hands of the experts, in the same sense and to the same extent as the average private person places himself in the hands of his medical adviser.

We can, however, say, in general terms, that with the help of such knowledge we shall be able to educate, *i. e.*, assist in the self-development of: (1) the body, in such a way that it shall be healthy and strong, highly skilled and efficient for practically carrying out the desires and resolves of the individual, and capable of readily receiving and fully enjoying and utilizing all sorts of physical experiences; (2) the mind,

so that it shall think sanely and wisely about all the experiences of the individual, and thus relate him to his environments in the most happy and helpful ways; and (3) the moral nature, so that the individual shall appreciate all that is highest and best in human life and endeavor, and shall order his conduct accordingly.

Two vital limitations are necessarily attached to the realization of these results: first, they can only be realized in so far as, and to the extent that, the individual is endowed by nature with the power to be developed, and its capacity for development; and second, that during childhood only certain powers can be developed, and these only to a certain extent. For example, reason as the ordinary adult understands it does not exist in the child, nor does sex. Thus the scientist tells us that it is absurd to talk of teaching science to a child; and this is largely true, but it is not less true, and it is vitally essential to recognize that true reasoning and scientific thinking have their preparatory stages, and if these are not properly provided for, the later stages seriously suffer. Similarly with regard to religion, politics, sex, etc., the child has to be *prepared* for these, and unless this is done wisely and well we shall be likely to get agnosticism, scepticism, anti-sociability, sex-perversion, etc., in their worst forms. This is a grave matter and demands urgent and serious attention. We have already learned, through painful failures, that the teaching of certain stages of certain subjects should not be begun in the infants' schools, or in the lower part of senior schools, because the child is not yet ready for them, and is hindered and injured by attempting them. It seems that we have yet to learn this all-important truth with regard to religion, politics, sex, etc. We should take care that we do not learn this accidentally, through disastrous blundering, but deliberately by means of scientific investigation and experiment. At the bottom of all this lies the old fallacy of treating children as adults who have not yet grown up, but are otherwise quite capable of thinking and acting in the same way.

We have said that "two vital limitations are necessarily attached" to the education of children, and it remains to be said that one other limitation ought in equity to be attached to it, viz., that there should be a deliberate and definite attempt to avoid, as far as possible, prejudicing, through school education, the views and convictions of the individual when he or she comes to adult age. There are, of course, parental and political as well as educational reasons for this. With the two first of these we are not now concerned. Of the third we can say that the educational objection to such prejudicing of the mind in favor of certain views and convictions is, in principle, the same as prejudicing the physical education of the individual in favor of cobbling or flying. One result must be a very inadequate and one-sided form of development, which as a matter of fact may not eventually be utilized and will always be an obstacle, if not a barrier, to other forms of physical development. But another and still worse result will be that individual and collective human progress is thereby prejudiced. Probably much, if not most, of the progress possible for each generation is lost through the young adult not having had his powers, as a whole, properly prepared, and kept sufficiently unprejudiced, to judge life's problems fully and fairly, and to carry out his judgments with adequate skill and force. One of the chief remedies for this is a clear conception of what is the supreme ideal in school education, and a generous devotion to the task of realizing it. This is at least one means by

which a man may save his soul alive, and thus fulfil his part in the efforts by which humanity seeks to achieve its highest destiny, for it will aim by the most scientific means, help him to make the best of himself as a child, and leave him as a man free and wise to do what can only be done when he is a man, and by himself. No man is well educated who is not as highly qualified and as free as it is possible for him to be to decide for himself what he will do with his self and his inner life; and this is the first and last justification for the search after the supreme ideal in school education.

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ON CORRELATION AND DISCIPLINARY VALUES

In recent years a very violent attack has been made in some quarters on the well-founded opinion that school subjects, and particularly certain of them, possess a high degree of disciplinary value. The anti-disciplinarians have made up in volume of sound for what they have lacked in numbers, and in consequence have had considerable influence in stimulating hasty and ill-considered changes in our school curricula. That intelligent public opinion is emphatically opposed to such changes was shown in a striking manner in a recent paper in this journal.[1] How then, in the face of this fact, have those who are completely opposed to the idea of disciplinary values succeeded in persuading many school boards and school officials of the soundness of their contentions? The answer to this is very simple. They have made sweeping claims of a sound scientific basis for their opinions, and the aforesaid boards and officials, not having the leisure or training to examine such claims, have accepted them at their face value. This is indeed unfortunate, for the scientific basis of the anti-disciplinarians seems on careful examination to be largely imaginary.

The arguments against disciplinary values divide themselves into two groups; one based on attempts to determine experimentally the influence of training in one field of mental activity on efficiency in other fields, and the other based on the amount of correlation between the efficiency shown in different fields. The present paper deals only with the arguments based on correlation.

The anti-disciplinarians have attempted in public addresses and text-books on pedagogy[2] to persuade our present and future teachers and school officials that there is very little connection between ability in one field of mental activity and ability in another field. They have claimed as one of their strongest arguments that there is a scientific basis for such conclusion. That this claim is not a valid one can easily be seen by examining recent literature on correlation between mental abilities in different fields. In the first place this literature could hardly be said to furnish a sound basis for any very definite conclusions, since there is wide disagreement between the various writers as to the amount of correlation between different mental activities. In any event it could not be said to support the contention that there is very little connection between ability in one field and ability in another field. The weight of evidence is in the contrary direction.

We shall consider here briefly the significance of the literature on correlation be-

[1] *Cf.* Hancock, "What Course of Study should be taken by a Boy who is Entering High School?" this journal, Vol. I. (1915), p. 893.

[2] The writer does not wish to imply that all workers in the pedagogical field have been guilty of the errors discussed in this paper.

tween abilities in different school subjects. As is well known, the closeness of relation between subjects is usually measured by computing what is termed a correlation coefficient. This coefficient varies in value from -1 in the case where ability in one subject is a linear function of ability in the other with variation in opposite senses to $+1$ in the case where a linear functional relation subsists with variation in the same sense, taking on the value zero for the case where the two abilities are completely independent of each other. One of the first things to determine with regard to this coefficient is the interpretation to be placed on fractional values of it, *i. e.*, values intermediate to the three values mentioned above. To say off-hand that only values of 0.8 or 0.9 indicate a close connection between two fields of mental activity, values from 0.5 to 0.8 a moderately close connection, and values below 0.5 little connection, is at once highly arbitrary and highly unscientific.

The danger of such a procedure may be illustrated in the following manner. Suppose we were comparing the lengths of rods and had given to us the ratios of the lengths of different pairs, the smaller length being divided by the greater. This ratio would vary from 0 to 1, and its value in any particular case would give us a fair idea of the difference in length of the rods, provided all the lengths lay between a certain known minimum value and a certain known maximum value.

But suppose on the other hand we did not know whether it was the ratio of the lengths, or the tenth power of this ratio, or the tenth root of this ratio that was given to us. The given quantity would vary from 0 to 1 in all three cases, but where it was 0.5 in the first case it would be about 0.001 in the second and about 0.93 in the third. It is evident that the given quantity will not tell us much about the difference in length between the rods if we do not know in what way it is related to those lengths.

Precisely the same difficulty is faced in interpreting the meaning of correlation coefficients after they are computed. Some writers have passed lightly over this difficulty by stating arbitrarily that certain ranges of values indicated little connection between the mental abilities involved and other ranges close connection. That such a procedure is absolutely unscientific and untrustworthy can be seen from the above illustration.

The most satisfactory way to proceed is to define in some adequate manner just what we mean by the closeness of relation between two fields of mental activity, and then determine in what way the value of the coefficient of correlation is functionally dependent on this closeness of relation and whether this functional dependence is the same in all cases. This is not easy to do and does not seem to have been done in the past. We shall return to this point of view later in the paper and show that the proper interpretation of the value of a correlation coefficient is a matter that requires careful investigation.

There is another method of procedure less satisfactory than this but far better than a purely arbitrary method. This is to compare values we obtain for correlation coefficients with values obtained in other cases where we have fairly definite ideas as to the closeness of relationship. This method is open to the objection that it is based on the rather large assumption that the correlation coefficient is the same function of closeness of relation in all cases. However, it is the only way in which it has been possible in the past to give a definite interpretation to correlation coefficients obtained in the study of relations be-

tween different mental activities. Hence this method will furnish a fair test of how careful the anti-disciplinarians have been in their interpretation of correlation results.

Prior to the use of the correlation coefficient to measure the relationship between different fields of mental activity, it had been used principally in the study of heredity. It seems to have been used there first by Galton and afterwards more extensively by Pearson.[3] To get an idea of the connection between the size of a correlation coefficient and the closeness of relation between the corresponding variable quantities we may consider some results obtained by Pearson in the study of collateral heredity. In the course of a paper in the *Philosophical Transactions*[4] he gives the following coefficients for correlation in stature between sisters, between brothers, and between brother and sister in English families of the upper middle class (*cf.* p. 281 of the memoir cited).

Sister-sister .... 0.44 Brother-brother ... 0.39
Sister-brother 0.38

These values are less than some given previously by Galton, but Galton used a different method from Pearson's to obtain his coefficients and in addition his data, as Pearson points out in the same paper, was accidentally chosen in such a manner as to emphasize correlation. Pearson concludes in this paper that the coefficient of correlation for collateral inheritance can not exceed 0.5, at least for the middle classes (*l. c.*, p. 284). Some later computations from further data, the results of which were published in 1901, gave him a coefficient of 0.51 for correlation in stature in collateral inheritance.[5]

As comparison of correlation coefficients seems to have been in the past the only adequate means of estimating the closeness of relationship from the value of a correlation coefficient, we would naturally expect, in view of the above results, that correlation coefficients ranging from 0.4 to 0.5 would be considered by careful writers whose work was published subsequent to Pearson's investigations, to correspond to a very considerable degree of relationship between the variable quantities involved, and values above 0.5 to a high degree of relationship. However, the anti-disciplinarians seem more anxious to justify their prejudices than to arrive at results of scientific value, so we frequently find them referring to correlation coefficients in the range just mentioned as corresponding to a *low* degree of relationship between the variables involved.

We are now ready to consider briefly some of the numerical results obtained in the study of correlation between abilities in different school subjects. One of the earliest published papers dealing with this matter is by Wissler.[6] Wissler investigated the correlation between abilities in different subjects by means of the grades obtained by some 200 college students at Columbia University. The correlation coefficients, ten in all, range from 0.51 to 0.75, with the exception of the coefficient for French and rhetoric which was found to be 0.30. In view of the other results this latter coefficient seems to be rather anomalous. At any rate Wissler's results certainly indicate a high degree of relationship between the subjects involved if they indicate anything.

[3] For this reason the coefficient of correlation ordinarily used is frequently termed the Pearson coefficient of correlation. The formula used by Pearson goes back to Bravais, though the latter did not introduce a single symbol for it.

[4] *Cf. Philosophical Transactions of the Royal Society of London*, Vol. 187A, 1896, p. 253.

[5] *Cf. Nature*, Vol. 65, 1901–02, p. 118.

[6] *Cf. Psychological Review*, Monograph Supplements, Vol. III., 1901.

In 1903 a series of papers[7] dealing with correlation between abilities in different school subjects was published under the editorship of E. L. Thorndike. The weight to be attached to the results of these papers is diminished by a variety of factors, such as inconsistencies in the results themselves, the manner of selecting data, etc. It is still more seriously diminished by the fact that the editorial supervision received did not serve to eliminate a number of incorrect statements, one of which at least is obviously absurd. The particular error referred to occurs on page 12 in the paper by A. G. Smith, where the following statement is made:

> When its (the correlation coefficient's) value is any fraction of + 1.00, it means that the possession of any degree of ability in one of the pair of studies implies the possession of that fractional part of that degree of ability in the other one of the pair.

In other words, since the correlation coefficient is a mutual relation between the two variables involved, if a correlation coefficient for English and Latin is 0.3, the student's ability in English is three tenths of his ability in Latin while at the same time his ability in Latin is three tenths of his ability in English. Is this the sort of scientific basis the claims of the anti-disciplinarians rest upon?

Even if we allow to the results of these papers a weight far beyond what they deserve in view of such errors as the above, they can in no sense be said to prove the contention that there is little relation between ability in different school subjects. Many of the correlation coefficients obtained lie in the range from 0.4 to 0.5, and some of them are well above 0.5, although the manner of selecting data was such as to decrease the true correlation. In spite of this fact the writers of the papers contend that their results show little relation between the subjects involved. However, since one of the writers apparently did not have a clear conception of the meaning of a correlation coefficient, it is not astonishing that the others should be unaware of the significance of the size of a correlation coefficient.

In 1904 Spearman gave correlations obtained for the four subjects, classics, French, English and mathematics, ranging from 0.64 to 0.83.[8] At the same time he pointed out the fact that correlations might be considerably attenuated by errors of observation, and suggested a formula for correcting for such attenuation.[9] Spearman's formula has been considerably discussed pro and con since its publication, and proofs of it which show clearly the hypotheses upon which it rests have been given by Spearman and Yule. The stringent nature of these hypotheses makes it apparent that the formula is not of such universal applicability as was at first contended. However, Spearman made a valuable contribution to the theory of correlation in pointing out the attenuation of correlation coefficients by accidental errors, and his writings had the salutary effect of causing some of those who had been drawing conclusions from correlation coefficients without paying much attention to the accuracy or significance of these coefficients, to be a little more careful about making rash statements. It seems quite probable that Spearman's formula as well as some later ones obtained by him,[10] may be more useful in the future, when mental measurements have increased in accuracy, than they are at present.

In 1908 a study of the correlation be-

[7] *Cf.* Columbia University Contributions to Education, Vol. XI., No. 2

[8] *Cf. American Journal of Psychology*, Vol. XV., 1904, p. 275.

[9] *L. c.*, p. 89.

[10] *British Journal of Psychology*, Vol. 3, 1909–1910, p. 271.

tween ability in mathematics and ability in foreign languages, and also of the correlation between ability in mathematics and ability in natural science was made by Rietz and Shade.[11] The correlation coefficient for mathematics and foreign languages as determined from grades of freshmen students at the University of Illinois was found to be 0.48, that for mathematics and natural science 0.44. Comparing these coefficients with some of the coefficients obtained in the study of inheritance the writers conclude that efficiency in mathematics and efficiency in foreign languages or natural science go together in general to a high degree. In view of the standing of one of the writers as an expert on statistical subjects this conclusion deserves especial consideration.

It will be well to say a word in passing with regard to the care with which the writers of the paper just mentioned have exhibited the data on which their computations were based, as compared with the carelessness in this respect of many writers on correlation. A correlation coefficient given without the data on which it is based loses half of its value. In the first place there is no way of checking the computations of the writer and any mistakes he has inadvertently made will affect the coefficient. In the second place there may be important inferences to be drawn from the data themselves which the writer has overlooked or omitted.

It is apparent from the numerical results that have been discussed above that they furnish absolutely no basis for the contention that there is little relation between abilities in the different subjects of the school curricula. Taking the correlation coefficients as they were found they not only do not justify any such conclusion, but on the contrary tend to justify an exactly opposite conclusion. Moreover, there is considerable reason to believe that if the correlation coefficients could be corrected for a variety of disturbing influences that affect their accuracy, they would be increased in value. It does not seem practicable at present to make such a correction, but there is another method of procedure which is quite satisfactory. This method consists in computing correlation coefficients for successive grades in the same subject and comparing with them correlation coefficients for grades in different subjects. In this manner the significance of these latter coefficients is more clearly understood.

The writer has computed the correlation coefficients for successive grades in algebra obtained by a group of 254 boys and another group of 198 girls, all students of Hughes High School, Cincinnati. He has further computed the correlation coefficients for geometry and English, for 229 students of the first group and 192 students of the second group.[12] The data on which the computations were based and the results are given below.

The data are arranged in the form of correlation tables, except for a few isolated cases that it seemed better to give separately for the sake of economy of space. The column headings for the algebra-algebra tables refer to first semester grades, the row headings to second semester grades. The column headings for the geometry-English tables refer to grades in English, the row headings to grades in geometry. In arranging the grades in classes, grades from 28–32 inclusive were

[11] *University of Illinois Studies*, Vol. III., 1908–1910.

[12] The data for these computations were obtained through the kind assistance of Mr. C. F. Siehl, teacher of mathematics at Hughes High School. The omission of some of each group for the second computation was of course due to lack of data.

put in the 30-class, grades from 33–37 inclusive in the 35-class, and so on. This scheme makes for compactness in exhibiting the data and convenience in computation, and it involves no material sacrifice in accuracy if any.

ALGEBRA-ALGEBRA (BOYS)

	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30			1		1									
35	1													
40				1										
45							1							
50					1	2	1							
55					1		2	1	2					
60		1				3	3	3	3	2	2			
65					2	2	3	7	8	6	1	1		
70				1	2	2	2	2	6	5	3	2		
75					2			3	6	2	2	1		
80						1	2	5	9	17	9	4	1	
85						1	2	3	3	5	7	9	1	
90								1	2	6	11	12	6	1
95										1	6	8	12	2
100												2		1

ALGEBRA-ALGEBRA (GIRLS)

	40	45	50	55	60	65	70	75	80	85	90	95	100
30			1										
35													
40													
45													
50						1	1	1	1				
55				2		2	1		1				
60				1	1	5	3	2	2	1	1		
65				4	2	6	7	3	2	1			
70				2	3	2	3	5	2	1			
75	1				1	1	2	3	4	3			
80			1			3	3	5	9	7		2	
85	1						3	2	7	10	6		
90									6	10	9	5	
95									3	2	6	11	1
100												1	

The data not appearing in the correlation tables will be given according to the following scheme: the first figure in parentheses is the row heading, the second the column heading; in the one case where the frequency differs from unity the third figure indicates the frequency.

GEOMETRY-ENGLISH (BOYS)

	45	50	55	60	65	70	75	80	85	90	95
30			2			3		1			
35	1		1					1	1		
40			1	1	2	1	1				
45	1			1	1	1		1			
50	1		1				1	1	1	1	
55						2	3	4	1		
60					1	2		4		1	
65			3		2	2	3	3	1	3	
70					1	4	3	5	4		
75			1	1	3	5	9	4	5	1	
80					2	2	3	6	8	4	2
85						4	7	4	9	7	1
90						1	1	9	12	10	2
95							3	4	3	8	1
100								1	1	3	

GEOMETRY-ENGLISH (GIRLS)

	45	50	55	60	65	70	75	80	85	90	95	100
30	1			1	1	2						
35			2	1	1							
40					3	2		1	1	1		
45					1	3	1					
50			1		1	1	2	2	1			
55		1	1			1	2	1	3	1		
60				1	1	4	3	3	2	2		
65			1		1	1	3	4	5	2		
70				2	2	1	3	3	3	1		
75					1		2	3	6			
80						1	3		6	3	1	
85			1			1	4	11	5	7	1	
90						2		2	4	8	2	
95						1	1	4	5	4	6	1
100									1	1		

Algebra-algebra (boys); (20, 60). Geometry-English (boys); (20, 70), (20, 80), (15, 80). Geometry-English (girls); (25, 60, 2), (25, 85), (20, 60), (20, 85), (5, 50).

The correlation coefficients obtained from the above data, together with their prob-

able errors, are given below. The probable error follows the correlation coefficient in each instance, being connected with it by a ± sign.

Algebra-algebra (boys), $r = 0.71 \pm 0.02$.
Geometry-English (boys), $r = 0.52 \pm 0.03$.
Algebra-algebra (girls), $r = 0.65 \pm 0.03$.
Geometry-English (girls), $r = 0.59 \pm 0.03$.

The writer does not wish to draw any sweeping conclusions from these results. In view of the many errors to which school grades are subject when considered as accurate measures of natural ability in certain fields of mental activity, there is considerable doubt as to the accuracy of correlation coefficients based on one or two sets of such grades. This, coupled with the fact that there is no certainty that a correlation coefficient is a satisfactory measure of the relationship between the school subjects, as will be shown later, renders it unwise to make any definite inferences on the basis of the above results. There is one thing, however, that these results make very evident, namely, the absurdity of some of the conclusions of the anti-disciplinarians. When the correlation coefficient for successive grades in the same subject may be 0.7 or less, it is apparent that there is absolutely no basis for the statement that there is little relation between subjects, the grades in which yield a correlation coefficient of 0.5 or more.

In so far as the above results justify conclusions they tend to show very strongly that there is a very close relation between ability in the two subjects considered, geometry and English. The correlation coefficients for the two subjects compare very favorably in size with the correlation coefficients for successive grades in the same subject. In the case of the boys the difference is only 0.19, whereas in the case of the girls the two coefficients are still nearer to equality, differing only by 0.06, a quantity just slightly greater than the probable error of their difference. It should also be borne in mind that the two grades in algebra were judgments of the same teacher, the grades in geometry and English judgments of different teachers, a fact which would tend to make the former grades correlate more closely than the latter ones.

On the whole it does not seem to the writer that sufficient work has been done on the correlation between different fields of mental activity to justify any final conclusions being reached. However, as this paper has aimed to point out, such work as has been done, far from justifying the contentions of the anti-disciplinarians, furnishes considerable support for conclusions directly opposite to theirs. It would be interesting to have correlation coefficients computed for groups of students selected from many different schools in different cities and then compared. Each group for which a coefficient is computed should come from the same school, since any lack of homogeneity in the data increases the doubtfulness of the result. Furthermore, only schools with a fairly large student body should be selected, since results based on small groups of students are less reliable, other things being equal, than those based on large groups. Finally, it would be highly desirable that those engaged in computing correlation coefficients should have some adequate conception of the mathematical principles involved in the theory of correlation.

In addition to the need for further numerical results in the field of correlation, there is also a need for further theoretical work on the significance of a correlation coefficient before we can hope to draw any final conclusions from such results. As

was pointed out earlier in this paper, it is of the highest importance to know, approximately at least, what sort of a function a correlation coefficient is of the closeness of relation between the variable quantities involved. If we do not know this we are in danger of drawing conclusions that are erroneous. Of course we can compare coefficients obtained in cases where we are doubtful of the degree of relationship with coefficients obtained in cases where we have considerable confidence in our knowledge of the degree of relationship. This method is only a makeshift, however, and should be replaced by a more accurate one.

The important matter from the educational standpoint with regard to the relationship between different fields of mental activity is the following: if, by training in one field, the average ability of a group of persons in that field is increased by a certain amount, and this in turn causes a certain increase in the average ability of the same group in some other field, what will be the ratio of the amount of increase in the second case to the amount of increase in the first case? If this ratio were the same for each of two given fields considered in its relation to the other, it would be the best measure of the relationship between the two fields. Hence, if the correlation coefficient is to be considered a satisfactory measure of the relationship between two fields it ought to approximate to this ratio in the case under consideration.

It can be shown mathematically that the correlation coefficient does not necessarily approximate to this ratio. In fact it is a simple matter to state conditions under which this ratio is 0.9 and the correlation coefficient less than 0.1. This does not imply that such discrepancies actually do occur but merely that they may occur, and unless we make sure that they do not occur it is unsafe to draw final conclusions from the values of correlation coefficients.

To include the mathematical discussion that forms the basis for the statements in the preceding paragraph would make this paper too technical in the mathematical sense for present purposes. The writer hopes to publish this discussion elsewhere in the near future, and at the same time to suggest hypotheses under which a correlation coefficient may be considered a reliable measure of the relationship between two fields of mental activity. Whether or not these hypotheses are fulfilled is a matter that remains to be determined.

Enough has been said here, however, to indicate that mathematical questions of some delicacy are involved in the interpretation of correlation results. That this has not prevented writers of little mathematical training, who had obtained correlation results by blindly following a given formula, from drawing sweeping conclusions from such results, only goes to show how little claim to scientific procedure the anti-disciplinarians have. It is evident from recent utterances that some of them are beginning to have an uneasy conscience with regard to the validity of their processes. It is to be trusted that they will go a little further in their admissions of error and frankly confess that they were not justified in drawing the conclusions they have drawn with regard to disciplinary values.

CHARLES N. MOORE
UNIVERSITY OF CINCINNATI

EDUCATIONAL EVENTS

EXETER'S NEW BUILDING

A NEW building at Exeter has arisen from the ruins of the old academy building, which fire levelled last year. The handsome new building, which was erected at a cost of $201,000, is in the general design of the original Exeter Hall built in 1794 and burned in 1870. Alumni have been generous, for they were

asked to give $145,000, and of that sum only $38,000 was lacking early in July. The corner-stone of the new building was laid November 5, 1914, by Nicholas E. Soule, of the class of 1835, the oldest living graduate, and a son of Gideon L. Soule, a former principal from 1838 to 1873. The address was given by George F. Canfield, of the class of 1871.

From an article in the Boston *Transcript* we learn that the length of the new building is 186½ feet, and its depth 96 feet. The walls are of water-struck red brick, with trimmings of white marble. The roof is of slate, surmounted by a tall cupola, containing the bell and clock, and on the top is a ship for a weather vane. The interior is, in the main, colonial in style, varied in part by the late Georgian work. On the first floor are ten classrooms. On the second floor besides the chapel, there will be a study hall seating 110 students, and a lecture hall seating 240, three classrooms, two conference rooms, rest and toilet rooms, and a faculty room. The chapel is the largest room in the new building and occupies the entire central part of the second floor. It has a seating capacity of 800. By night it is to be lighted by a central chandelier of brass, with twenty-eight electric lights of high power and seven six-light chandeliers, all to hang from the ceiling. Four columns of rosario marble greet the eye upon entering the main hall. At the foot of each stairway stand two pedestal lights. In the lower halls hang eight lights of wrought iron and hammered glass, and there are six in the upper hall. The finish of the classrooms is of selected quartered sycamore, and the floors are of red birch. In the faculty room and chapel, wood block flooring is used for the first time in New Hampshire, if not for the first time east of New York City. Another feature of the building is the reenforced concrete floors, which are fireproof. Hollow tile terra cotta blocks of varying thickness form the walls, with New York hard plaster finished covering. The wall colorings have been selected with a view to restfulness. Buff, gray and green are used in many rooms. In the chapel a combination of light gray and salmon pink is used. A space has been reserved on the east end of the chapel near the stage for the memorial tablet to the late Harlan P. Amen. The building will probably be used when the new term begins, but the formal dedication will not take place until October 9, Founders' Day.

SCHOOL COLLECTIONS IN THE STATE OF WASHINGTON

Forty accredited high schools in Washington are to receive this fall collections of mineral and manufactured products of the state. The exhibits, carefully numbered and explained in an accompanying catalogue, are being prepared in the college of mines of the university for the extension division, which is distributing them; and they are expected to prove of great value to classes in geology and physiography. When the 40 schools which have applied for the specimens have been supplied, 110 exhibits will still be left on hand for others which may ask for them.

Each collection will contain 100 natural and 15 manufactured specimens. Ores bearing gold, silver and other precious metals will keep company with epsomite, from which epsom salts are made; talc, from which talcum powder is derived; thulite, a beautiful pink and green rock harder than marble and quite as attractive for interior finishing; not to mention such humble things as glacial pebbles, sand and clay.

The exhibits are instructive as to the resources of the state, for everything included, whether manufactured or natural, is native to Washington. The total collection will weigh in the neighborhood of twenty thousand pounds, individual exhibits weighing about 125 pounds.

Among the manufactured products included are dry press face brick, made from Clayton clay; glazed sewer pipe from Taylor No. 1 shale; vitrified paving brick from Renton shale; coal briquettes, beehive coke, retort carbon, and by-product coke from Black Diamond coal; cement clinkers and briquettes; architectural terra cotta from Taylor white clay; copper and tin ingots; miniature steel rails

and reinforcing bars; and Soap Lake salts from the waters of Soap Lake.

The specimens are arranged in natural sequence, running from common glacial rocks through the various types of sand to clays, fossils, sandstones, shales, veined pebbles, silicified (petrified) wood, peat, lignite, lignitic coal, bituminous and anthracite coals of various grades, granites, lava rocks, limestone and marble, residual rocks and clays, minerals, quartz, etc.

BUSINESS FELLOWSHIPS AT NEW YORK UNIVERSITY

FIFTEEN men have been practically placed under Dr. Jenks' business fellowship plan, and are now working for the respective business houses that have entered the arrangement. Some of them started as early as the first of July. Although there are no more positions to be filled this fall, applications continue to pour in from young men all over the country. More than three hundred are now on file.

Significant of the change which has come over the attitude of Americans toward work which necessarily means expatriation is the fact that the great majority of the applicants were looking forward to foreign trade. This desire is apparently not confined to any one section. Those applying are from north, south, east and west, tidewater and jerkwater, but the prevailing ambition among them all is to test the opportunities in foreign parts.

The houses which have accepted men under the fellowship plan are: the National City Bank; the United States Steel Products Company; the Union Pacific Railroad; the American Telephone and Telegraph Company; the United States Mortgage and Trust Company; the Western Electric Company; Robert H. Ingersoll and Brother; the Alexander Hamilton Institute; and the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce.

The adaptation of the plan varies in each individual case. One or two of the firms have systems of preliminary training of their own. Some of the men are going in on the same basis as any new man, merely being given a little more opportunity to shift around and learn various departments. Others are studying particular phases of the business. All will be given the advantage of special conferences in the School of Commerce to help shape their university work to conform to their business ambitions.

Four of the men are from Cornell, where Dr. Jenks is well remembered, and two from New York University. The names of the "fellows" are: Gardner P. Eastman, Amherst; S. T. Bitting, University of Virginia; M. L. Carey, Cornell University; W. B. Cokell, University of Denver; Ernest Jenks, Cornell University; Sumner H. Schleichter, University of Wisconsin; V. A. Davidson, Lafayette College and New York University; George R. Gear, University of Kansas; Louis Naetzker, George Washington University; Frank A. Carlton, Yale and New York University; Robert Mochrie, Cornell University; G. A. Bills, Cornell University.

BRITISH PARLIAMENTARY GRANTS FOR HIGHER EDUCATION

ACCORDING to an article in *Nature* the estimates for the year ending March 31, 1916, show the following parliamentary grants for universities and colleges in the United Kingdom:

GREAT BRITAIN

University of London	£8,000
Victoria University of Manchester	2,000
University of Birmingham	2,000
University of Wales	4,000
University of Liverpool	2,000
Leeds University	2,000
Sheffield University	2,000
Bristol University	2,000
Durham University	2,000
Scottish Universities	84,000
Colleges, Great Britain	150,000
University Colleges, Wales	12,000
Welsh University and Colleges:	
Additional grant	15,000
Total	£287,000

IRELAND

A.—Grants for the general purposes of the	

Queen's University of Belfast	£18,000
University College, Dublin.	32,000
University College, Cork..	20,000
University College, Galway	12,000
B.—Grants in respect of the cost of purchasing lands and providing or improving the necessary buildings and equipment for the	
National University of Ireland and University College, Dublin	40,000
University College, Galway (£1,850 revote)...	
C.—Additional grant in augmentation of sums amounting to £1,500 or more contributed from local sources in 1914–1915 towards increasing the resources of University College, Galway	2,000
Total	£124,000
Imperial College of Science and Technology	30,000
Royal College of Science, Dublin..	17,000
University institutions in respect of technological work	59,000
Grand total	£517,000

Certain of the universities, colleges, and other similar institutions which are in receipt of parliamentary grants have been adversely affected by the war, more especially by the loss of fee income arising from the widespread response among men students to the call for recruits. The estimates for 1915–16 include, therefore, a special grant of £145,000 in aid of such universities, colleges, medical schools and agricultural institutions, to meet loss of income arising during the war.

EDUCATIONAL NOTES AND NEWS

Rear-Admiral William F. Fullam has been relieved from his assignment as superintendent of the United States Naval Academy, to be succeeded by Captain E. W. Eberle, now commandant of the Washington navy yard and superintendent of the naval gun factory.

At the University of Washington, Dallas D. Johnson, director of the training school at the State Normal College at Bowling Green, Ohio, has been named assistant professor of education, to succeed Professor J. K. Hart, who will be on leave of absence next year and who is not expected to return to the university.

Dr. F. K. Sechrist, who received his doctorate from Clark University in 1913, has been appointed instructor in primary education in the University of Cincinnati college for teachers. Miss Frances Jenkins, assistant editor of the Riverside Readers, has also been added to the faculty as supervisor of elementary grades and instructor in methods.

Mr. C. E. St. John, for the last eight years superintendent of the schools of Marion, Kansas, has been appointed assistant state superintendent of public instruction.

At the University of Pittsburgh the following appointments in the school of education are announced for the coming academic year: George Ellis Jones, A.M., Ph.D. (Clark, 1913, 1915), of Clark University, assistant professor of education; Miss Meredith Smith, B.S., A.M. (Columbia, 1914, 1915), of Teachers College, Columbia University, assistant professor of childhood education; Miss Marguerite L. McLean, A.B., M.S. (Wisconsin, 1907; Columbia, 1915), of Teachers College, Columbia University, assistant professor of household economy. Miss McLean was formerly a member of the faculty but for the past two years has been doing graduate work in Teachers College. In the same school the following promotions have been made: Gardner Cheney Basset, Ph.D., from assistant professor to professor of educational psychology and director of the psychological clinic; Cecil Kenyon Lyans, Ph.D., from instructor to assistant professor of the history of education; Thomas William Burckhalter, B.S., M.P.E., from instructor to assistant professor of physical education; Miss Adele May Jones, B.S., from instructor to assistant professor of household economy; Miss Mary Gloyd Waite, B.S., from instructor to assistant professor of childhood education.

Western Reserve alumni of Los Angeles and vicinity took advantage of the presence of President Charles F. Thwing to hold an organ-

ization meeting on the evening of September 2. President and Mrs. Thwing have spent the summer in the Pacific Coast States. They will return to Cleveland about September 14.

RAY GREEN HULING, well known for his work in secondary education, died on September 4, at the age of sixty-seven years. Mr. Huling was born in Providence, R. I., and was graduated from Brown University in 1869. He became classical assistant at Fall River high school in 1869, which position he held until 1875, when he became principal of the Fitchburg high school. He retained that position until 1886 and then became principal of the New Bedford high school and remained until 1893, when he went to Cambridge as headmaster of the English high school. In 1899 he became a lecturer at Harvard University on the organization and management of schools. In 1900 he became an examiner at Boston University and trustee of Brown University.

BY a vote of 11 to 9, the Chicago Board of Education voted on September 1 to adopt the resolution of Jacob M. Loeb, chairman of the rules committee, calling for abolition of the Chicago Teachers Federation. The edict prohibits any teacher from membership in the federation or any kind of so-called labor organization. Teachers now members of the federation or any organization affiliated with the American Federation of Labor must withdraw immediately and at no time in the future establish a similar association. Mayor Thompson presently will have to fill six vacancies on the board. Of the retiring members, three voted for and three against the Teachers' Union. A contest before the mayor will be undertaken by the labor leaders for the appointment of school trustees favorable to the union, and failing in this, to prevent confirmation by the city council of the mayor's appointees.

ACCORDING to the *Akademische Rundschau*, in the summer term of 1914 there were, at the twenty-two German universities, eleven technical academies, five commercial schools, three veterinary schools and six agricultural and mining schools, 79,077 students entered, a number which in the autumn of 1914 had sunk to 64,710. Of this number the following were under arms:

University students	36,000
Technical students	8,000
Commercial students	6,000
Veterinary students	300
Agricultural students	300
Mining students	300
Total	50,900

The percentages of students of some of the universities who have gone to the front are: Königsberg, 84; Heidelberg, 60; Munich, 56; Berlin, 54. Of the technical academies Danzig sent the highest proportion of students—90 per cent. The total number of German professors and students killed in the war, up to the end of May, is said to be 1,191.

THE foundation stone of the new Welsh National School of Medicine at Cardiff was laid on August 12. At the ceremony then held Lord Aberdare, president of the college, recounted the history of the school from its inception, and Lord Pontypridd spoke on the prospects of its value to Wales and to the cause of medical education and research in Great Britain. At the luncheon afterwards Sir William Osler made an address.

THE regents of the Mercersburg (Pa.) Academy have voted to start a fund of $150,000 to endow the head master's chair at Mercersburg, this fund to be named after the present head master as the "William Mann Irvine Head Mastership Endowment Fund." A number of subscriptions have already been made to the fund. It seemed to be a fitting way in which to show appreciation of Dr. Irvine's services to the academy. During the past twenty-two years he has enrolled four thousand boys, representing every state in the union and fifteen foreign countries. More than half of these boys have entered ninety-six different higher institutions of learning.

THE governor of Indiana has appointed a commission to investigate the causes and prevention of mental deficiency in the state. The medical members of the commission are Drs. George F. Edenharter, superintendent of the Central Indiana State Hospital, Indianapolis;

Samuel E. Smith, superintendent of the Eastern Indiana State Hospital, Richmond; Charles P. Emerson, dean of the Indiana University School of Medicine, Indianapolis; Walter C. Van Nuys, superintendent of the Indiana Village for Epileptics, Newcastle; and Dr. George S. Bliss, superintendent of the State School for Feeble-minded Youths, Fort Wayne.

The forty-third annual meeting of the American Public Health Association, the fifteenth annual conference of the Sanitary Officers of the State of New York and the annual meeting of the New York State Sanitary Officers' Association, was held in Rochester last week. Before the American Public Health Association on September 7, the presidential address was delivered by Professor William T. Sedgwick, of the Massachusetts Institute of Technology, his subject being "Achievements and Failures in Public Health Work." Other speakers at the meetings were Dr. Hermann M. Biggs, New York state commissioner of health; Dr. W. C. Gorgas, surgeon-general United States Army, Washington, D. C., and the Hon. William C. Redfield, secretary of commerce.

Dr. Orin Tugman, of the staff of the research laboratory of the Eastman Kodak Company, has been elected associate professor of physics at the University of Utah.

Dr. L. Chas. Raiford, of the department of chemistry of the University of Chicago, has been elected professor of chemistry in the Oklahoma Agricultural and Mechanical College.

Dr. William P. Lucas has been appointed chairman of the committee on open air schools of the San Francisco Association for the study and prevention of tuberculosis.

A special committee of the Commission on Christian Education in the Federal Council of Churches has prepared a course of study for Sunday-schools on "International Peace." The lessons have been designed for adult classes and have been prepared by Professor N. E. Richardson.

BOOKS AND LITERATURE

Learning by Doing. By James Edgar Swift. Second edition. The Bobbs-Merrill Company, 1915.

In this interesting contribution to the study of education Professor Swift has aimed to aid teachers and pupils in their efforts to economize time. This increase in economy is to be obtained by better methods of teaching and study. By correct methods the present exacting demands of our complex industrial life may be met without depriving children of their childhood. These desirable aims may be realized when method is built on a knowledge of instinctive and acquired tendencies of pupils and on the laws of learning.

Our information about human instincts is rather indefinite so that we do not feel like criticizing him for emphasizing a general tendency of them all. "At bottom though, these instincts are the same—the tendency to contrive with mind or hand and then to do what one has thought. . . . The hopeful thing about children is that they always want to do something, and the successful teacher ascertains what they want and helps them to do it in an educative way." Since racial impulses demand expression in some sort of activity, undesirable habits are liable to be formed unless that activity is provided for by schools.

The claim is made, that following individual desires will not result in any lackadaisical, whim-following attitude on the part of pupils or teacher, it will result instead, in increased effort because of increased interest. It will let the pupil know there is some relation between his desires and the offerings of books, teachers and schools.

Swift follows his argument to its logical conclusions by advocating the greatest possible freedom for individual development according to individual interests. Ability to discover individual differences in "springs of action" in children and ability to preserve and develop this individuality, he says, is the first essential of efficient teaching. This in turn demands versatility in the use of methods of instruction. "The first thing to do is to get a

good method, and the second is to discard it." Following this rule will result in a freedom from "staleness" on the part of the teacher.

In a review of some recent careful experimentation, the author aims to prove that modern school methods are not teaching students to work or think. The remedy lies in the ability of the teacher to get out of the way, and give the pupils a chance to be the actors instead of the audience. "Thinking does not differ greatly from football in the manner of acquiring the art. There is but one way of learning either and that is by playing the game and playing it hard."

Chapter three is devoted to experiments conducted in various schools which are rather striking examples of situations which tend to prove the workability of his theories. They are not likely to be copied with any great success, but are suggestive of what any school teacher might accomplish.

It is in his chapters on laws and conditions of learning that the author is at his best. As pioneer and constant contributor in this part of experimental psychology, his words have more than usual weight. The untechnical language and lively style make the valuable information accessible to the layman as well as the expert. The meaning of plateaus, warming-up-periods, higher and lower order of habits, and relation of consciousness to progress are briefly but clearly considered. Factors influencing rate of progress, such as, physical and mental condition, personal attitude toward task, time, interfering habits and the like are also briefly but carefully handled.

In his two closing chapters, Swift champions the doctrine of education for adaptability. While there are certain habits of behavior that should become automatic, the rapidity of change in modern industrial and commercial life calls for ability to adapt quickly to these changing conditions. We are not all as optimistic as the author in our belief about the possibility of training for a general power of adaptability, but too much emphasis can hardly be put on efforts to develop and maintain an attitude of open mindedness, an attitude that will help to see situations in ever-varying yet progressive ways. This, after all, is little more than a matter of intellectual honesty and common sense. DEAN R. BRIMHALL

EDUCATIONAL JOURNALS

The Pedagogical Seminar—September

Somatic development, a criterion of mental measurement: Francis Lee Dunham, M.D.

Experimental study of dynamic periodicity as influenced by diurnal, weekly, monthly, seasonal and yearly efficiency: Emery L. Kuhnes.

A comparative study of the curricula of Wellesley, Smith and Vassar colleges: Hermione L. Dealey.

History of education in state normal schools: C. L. Robbins.

A critical study of Rice's investigation of spelling efficiency: W. F. Tidyman.

Wandering scholars: M. W. Meyerhardt.

The teaching of current events: Charles E. McCorkle.

Problems of normal schools: John Alden Hancock.

The function of the training school: George H. Shafer.

The Educational Review—September

The University of Wisconsin: J. H. Sturtevant.

Entrance examinations in Latin: Nelson G. McCrea.

Academic fees in the United States: Frank A. Dickey.

A vocational census of college students: James Burt Miner.

The first school survey: Guy F. Wells.

The high school student and the dictionary: W. H. Sanders.

The American School—August

The educational month.

Minimal essentials in geography and history: W. C. Bagley.

Editorial contributions.

An experience with testimonials: J. W. Crabtree.

Ideals in rural education: J. L. McBrien.

How a superintendent may guide his teachers in the motivation of school work: H. B. Wilson.

The Journal of Home Economics—August-September

House construction in California: Georgie Boynton Child.

A study of the management of the farm home: Ilena Bailey.

Home economics work under the Smith-Lever act: A. C. True.
Application of the Smith-Lever funds.
Life in rural France: Compiled by Helen W. Atwater.
The home and child labor: Frederick G. Bonser.
Child labor laws pending.

QUOTATIONS

THE ANNAPOLIS SCANDAL

The Court of Inquiry appointed by Secretary Daniels to investigate the scandal at the Naval Academy has made its final report, and on its recommendation, approved by the Secretary, the President has signed the orders for the dismissal from the Academy of two midshipmen charged with having seen and used copies of examination sheets which were intended to be given in this year's test for promotion. Upon other midshipmen were visited penalties ranging from an official reprimand to being dropped an entire class in the Academy.

It will be recalled that the original recommendation of the Superintendent of the Academy which precipitated the present investigation called for the dismissal of seven midshipmen for having had previous knowledge of an examination paper which they must have recognized when the examination itself was held. The Superintendent of the Academy held that, while they might have innocently acquired possession of copies of the examination papers—due to the practise at the Academy of giving out "dope" or outlines of courses—nevertheless these students were guilty of a very grave offense against discipline when they failed to report the fact that they had seen these examination papers previously to their having been made public by the authorities. Accordingly the two midshipmen were dismissed and fifteen others recommended for discipline. The Court of Inquiry finds that sixty-three and four-tenths per cent. of the first class and eighty per cent. of the second class had received prior to the examination varying amounts of the so-called "dope" that later proved to be the substantial portion of the examination paper. Evidence further showed that sixty-three midshipmen had surreptitiously and without authority visited one or more of the various departments of the Academy at unauthorized times for the alleged purpose of obtaining their marks in advance of publication, and that there were undoubtedly numerous other midshipmen who indulged in this practise. Further investigation of this subject is recommended by the Navy Department or the Superintendent of the Naval Academy.

While the punishments given were severe, it hardly seems that they meet the situation as exposed by the Superintendent of the Academy in his original recommendation. So systematic a betrayal of the best interests and highest ideals of the Academy as has been outlined by the finding of the Naval Board calls, it would seem, for more dismissals than were recommended to and approved by the President. Dishonor in the Academy strikes home to the nation as no similar dishonor in any private institution would do. If the board of inquiry has secured less than a complete eradication of the malign growth, the fact is to be seriously lamented.—*The Outlook.*

EDUCATIONAL RESEARCH AND STATISTICS

THE GENERAL EFFECTS OF VISUAL SENSE TRAINING IN CHILDREN[1]

Though many experiments have been performed to test the general effects of the training of specific functions, there is as yet no agreement upon the extent, the amount and the means of transfer. By extent is meant the range of influence the training in a specific function has over untrained specific functions in accordance to the degree of similarity. One author states that the improvement in any single function rarely brings about equal improvement in other functions. Yet another author finds cases in a single experiment where the improvement is absolutely greater in the test than in the training. By the amount of transfer is meant the aggregate of

[1] Paper read before Section L, A. A. A. S., sixty-sixth meeting, being an abstract of a study to be published by Warwick & York, Baltimore, Md.

improvement in an untrained function as a result of training in a similar function. In the past experiments each experimenter has found a different amount. This was due partly to the different methods of calculation and partly to the treating of different functions. There is a special need now for standardization in our methods of experimentation as well as in the methods of calculating our results. Nor is there agreement among educators as to the means of transfer. The following are various means of transfer thus far found by different experimenters, as summarized by Colvin: identical elements; improvement of habitual methods of recording facts; the training of attention and will power; divesting the essential process of unessential factors; greater habituation and more economical adaptation of attention; the effective use of imagery; the development of ideals; learning technique and the sympathetic interaction of allied memory functions.

Since there are these disagreements, it was the purpose of the writer to continue the experimentation and, if possible, contribute something to our knowledge of the extent, amount and means of transfer within the function of discrimination in children. The work was done in the departments of education and psychology, University of Michigan.

Three experiments were performed. In the first experiment the discrimination of differences in length of lines formed the training and the discrimination of differences in pitch, color and lines of other sizes and forms, constituted the tests. A group of seven children took both the tests and the training, while another group of six took only the tests. The ages of the children ranged from 9 to 11 years, with an average about 10, in both groups. The training was given in discriminating the relative length of lines drawn 1/5 mm. wide, ranging in ten steps from 1 1/3 to 1 2/3 inches with a constant difference of 1/30 of an inch to be discriminated. The Cattell fall apparatus was used to expose the cards on which the lines were drawn. The reaction time for every judgment was recorded by means of the Bergström chronoscope. Twenty judgments, of pairs of lines arranged differently every day, were given by each subject individually. This usually took from 12 to 15 minutes per individual. There were 48 trainings, altogether covering a period of more than four months. It is interesting to note that on the whole there was a correspondence between long reaction time and a low number of wrong judgments. This seems to show that improvement in sense training is largely a matter of time of judgment. The visual sense organ and the central processes need time for better adaptation and accommodation. When this is taken, fewer errors are made. There was a strong impulse on the part of the subjects to reduce the reaction time whenever they could, but this they found they could not afford. A comparison of the averages of the first three trainings and those of the last three trainings shows there was a decrease in wrong judgments of about 40 per cent., or, we may say, an improvement due to the training of 40 per cent. There was a corresponding loss of 10 per cent. from the standpoint of reaction time.

Table I. shows the various amounts of improvement in the tests after the training. The results of the pitch and color tests do not indicate any transfer and are therefore not represented here. Column 1 shows the order in which the different tests took place: circles, triangles, vertical lines and horizontal lines; column 2, the number of judgments; 3, the number of cards used; 4, the length of lines; 5, the differences to be discriminated, in each test; columns 6, 8, 10, 12, the number of wrong judgments made; and columns 7, 9, 11, 13, the average reaction time recorded (in sigmas). It will be noticed that although there are indications that the larger amounts of improvement are connected with the cases which are most similar to the training in size, form and differences to be discriminated, yet there is a lack of regularity. This, however, may be accounted for by the reaction time. Wherever there is a gain in time there is generally a loss in the number of right judgments, and vice versa. On the whole, the trained group has a slight gain in the number of right judgments and a loss in the amount of reaction time, while

TABLE I

Average Number of Wrong Judgments and Reaction Time of Trained and Untrained Groups, Both in Preliminary and Final Tests

Series of Tests	Number of Judgments	Number of Cards	Length of Lines, Inches	Differences Discriminated, Inch	Preliminary Test				Final Test			
					Trained Group		Untrained Group		Trained Group		Untrained Group	
Column 1	2	3	4	5	6	7	8	9	10	11	12	13
Circles *A*	10	6	2 1/10 to 2 3/5	1/10	1.00	1,179	2.33	1,856	1.57	1,430	.33	1,719
" *B*	"	"	1 1/3 " 1 2/3	1/15	1.43	1,129	1.33	1,831	1.29	1,487	2.13	1,664
" *C*	"	"	3/4 " 1	1/20	1.86	1,262	1.83	1,489	1.29	1,332	1.50	1,547
Triangles *A*	"	"	2 1/10 " 2 3/5	1/10	2.57	1,330	1.67	1,689	1.71	1,652	1.67	1,559
" *B*	"	"	1 1/3 " 1 2/3	1/15	2.29	1,250	2.00	1,525	2.00	1,257	2.40	1,525
" *C*	"	"	3/4 " 1	1/20	1.29	1,096	1.80	1,713	1.86	1,217	2.80	1,532
Vertical lines *A*	"	"	2 1/10 " 2 3/5	1/10	2.29	1,231	3.40	2,212	2.00	1,469	2.60	1,800
" " *B*	"	"	1 1/2 " 1 2/3	1/15	1.29	1,257	2.00	1,450	.43	1,221	1.40	1,358
" " *C*	"	"	3/4 " 1	1/20	2.86	1,198	1.60	1,525	2.14	1,566	2.40	1,535
Horizontal lines *A*	"	"	2 1/10 " 2 3/5	1/10	2.43	1,088	2.80	1,567	3.00	1,364	2.20	1,718
" " *B*	"	"	1 1/2 " 1 2/3	1/15	1.86	1,179	3.00	1,796	3.43	1,354	3.20	1,545
" " *C*	"	"	3/4 " 1	1/20	2.29	990	2.40	1,545	2.00	1,409	2.60	1,424
Circles *a*	20	11	1 1/3 " 1 2/3	1/20	6.57	1,172	6.83	1,730	3.86	1,499	6.83	1,596
Triangles *a*	"	"	" " "	"	6.14	1,125	7.83	1,378	6.14	1,315	7.50	1,465
Vertical lines *a* (for training only)	"	"	" " "	"								
Horizontal lines *a*	"	"	" " "	"	7.14	1,122	7.67	1,381	5.71	1,342	7.67	1,311
Total					43.31	17,608	48.49	24,687	38.43	20,914	47.23	23,198
Percentage of improvement									11.27	−18.77	2.60	6.03
" " transfer									8.67	−24.80		

it is just the other way with the untrained group.

The second experiment was performed at the same public school and different children were chosen from the same grades. For the preliminary and final tests a printed page of three-lettered nonsense words was used. When each subject came into the room and sat down, a paper with a written alphabet was shown him. The written alphabet was divided into two parts, from a to m and from n to z. The subject memorized the letters belonging to each half for about three minutes, after which he was given a page of the nonsense words and asked to underline words that contained either two or three letters in the second half of the alphabet. Ten minutes was allowed the subjects in the tests. For training, a different page containing the same kind of nonsense words was used, but the subjects were asked to underline words containing two or three letters in the first half of the alphabet. There were altogether three trainings for each subject, averaging about 8½ minutes each, and the interval between each training was about ten days.

The result of the training is presented in Table II. Column 1 represents the subjects; 2, the amount of training each received, in minutes; columns 3, 7, 11, the number of words covered, or the speed; 4, 8, 12, the number of words correctly marked, or accuracy; 5, 9, 13, the errors of omission; and 6, 10, 14, the errors of commission. This table is interesting on account of the rate of improvement made by the subjects, as compared with the rate of improvement in the first experiment. There, with 48 trainings of 12 minutes each, covering a period of four months, the improvement was only 40 per cent.; while here, with only three trainings of about 8½ minutes each and covering a period of one month, the amount of improvement was almost twice as great. The explanation is found in the fact that in the second experiment the difficulty of the problem, that is, the grouping of the alphabet into two halves, was easily recognized by the subjects. As a result of this recognition,

various methods were developed to meet the difficulty. Some of these methods were: to note independently which half each letter belonged to; or to repeat the alphabet as a whole or in parts to ascertain the position of a letter that was not certain; or to refer the uncertain letters to those nearest ones which the subject was sure about. At the end of the third training every subject had a way to explain his improvement. But this was not the case with the training in the first experiment. There the idea of shortening the reaction time tained three consecutive different letters. Beginning with the top of the page, word one was compared with word two, word two with word three, and so on to the end of the line. The last word in each line was compared with the first word of the next one.

This experiment was performed three times, first with school children thirteen years old, second with school children of fifteen, and lastly with university students. As in the second experiment, the improvement by training was rather rapid.

TABLE II

Improvement of Last Ten Minute Test Over the First One in Marking Letters of the Second Half of the Alphabet

		Preliminary Test				Final Test				Improvement			
Column 1	2	3	4	5	6	7	8	9	10	11	12	13	14
XVII	29 minutes	143	59	6	2	176	74	1	2	33	15	5	0
XVIII	29 "	29	13	2	2	118	48	36	0	89	35	−34	2
XIX	24 "	115	46	5	21	53	27	2	0	−62	−19	3	21
XX	25 "	306	117	31	3	212	91	11	1	−94	−26	20	2
XXI	25 "	125	51	9	20	192	79	41	10	67	28	−32	10
XXII	25 "	98	39	7	22	167	69	12	22	78	30	− 5	0
XXIII	21 "	138	58	11	3	196	83	11	1	58	25	0	2
XXIV	26 "	160	65	3	4	206	90	9	2	46	25	− 6	2
XXV	33 "	82	34	14	14	273	113	57	8	191	79	−43	6
XXVI	21 "	135	56	3	5	285	115	28	2	150	59	−25	3
Total	258 "	1,322	538	91	96	1,878	789	208	48	556	251	−117	48
Average	25.8 "												
Percentage of improvement										42.06	46.65	−128.57	50.00

Column 1, subjects.
Column 2, amount of time spent in training.
Columns 3, 7, 11, number of words covered.
Columns 4, 8, 12, number of words correctly marked.
Columns 5, 9, 13, errors of omission.
Columns 6, 10, 14, errors of commission.

dominated. That the use of more time was necessary for better success was never clearly brought to consciousness. These two experiments seem to confirm the view that the development of methods is quite essential to rapid improvement.

The third experiment consisted of marking five-lettered nonsense words. In the training the subjects were asked to place a mark between two words which had two adjacent letters in common. In the tests before and after training the subjects were asked to place a dash between two adjacent words which con-

The most interesting result from this experiment was that the amounts of transfer were regular in accordance with the age of the subjects. Table III. presents the results of the three performances. Column 1 represents the trained and untrained subjects; columns 2, 6, 10, the number of words covered; 3, 7, 11, the number of dashes rightly placed; 4, 8, 12, the errors of omission; and 5, 9, 13, the errors of commission. The regularity of the amounts of transfer can be explained by the application in the tests of methods which the subjects developed in the training. The thirteen-year-old

TABLE III

Total Amount of Transfer in Marking Two Adjacent Five-lettered Nonsense Words Having Three Consecutive Different Letters

A. Experiment with Thirteen-year-old Subjects

	Preliminary Test				Final Test				Percentage of Improvement			
Column 1	2	3	4	5	6	7	8	9	10	11	12	13
XXVII	69	15	8	13	62	20	7	23	−10.14	33.33	12.50	−76.92
XXVIII[2]	36	13	1	9	41	12	3	9	13.89	− 7.69	−200.00	0
Transfer									−24.03	41.02	212.50	−76.92

B. Experiment with Fifteen-year-old Subjects

XXIX	160	38	0	6	197	55	4	0	23.12	44.74	− ∞	100.00
XXX[2]	130	42	1	27	105	26	7	9	19.23	−38.10	−600.00	66.67
Transfer									3.89	82.84		33.33

C. Experiment with College Students

XXXI	88	20	12	3	141	49	0	1	60.23	145.00	100.00	66.67
XXXII[2]	142	48	3	17	211	64	5	22	48.59	33.33	− 66.67	−29.41
XXXIII[2]	105	35	0	50	142	48	3	5	35.24	37.14	− ∞	90.00
Total (XXXII plus XXXIII)									83.83	70.47		60.59
Average (XXXII and XXXIII)									41.91	35.23		30.29
Transfer (XXXI minus average of XXXII and XXXIII)									18.32	109.77		36.38

Column 1, subjects; 2, 6, 10, number of words covered; 3, 7, 11, number of dashes correctly placed; 4, 8, 12, errors of omission; 5, 9, 13, errors of commission.

subjects used the method of comparing every pair of words by letter groups of two or three; the fifteen-year-old, by the whole-word method; while the adult subject adopted the method of directing the attention to the three central letters of each word, ignoring the terminal letters. This last method proved to be even better fitted for the test than for the training, from which it originated. It is the view of the writer that these different time-saving methods account for the differences in the amounts of transfer.

To sum up the most important results of these experiments:

1. Sense training or sense education is a misnomer. The mere training of the sense organ does not lead to a great amount of improvement. This is probably due to the limitation of the nerve endings. A certain amount of improvement can be brought about by giving the sense organ time for adaptation.

2. The principal means of transfer found in these experiments was the methods developed in training and later on applied in the tests. Children as well as adults made use of these methods on seeing similar situations.

3. The amount of transfer depended upon the efficiency of the method used. Adults, being able to form better methods, were therefore able to show a larger amount of transfer.

4. It was found, in one case, that the method developed in the training was really better fitted for the test. If the value of a training depends upon its fitness when applied to similar situations, there is no reason why the training limited to a specific situation may not benefit even to a greater extent a similar situation. The method may be better fitted for the latter than for the former, though such cases probably are unusual.

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[2] Untrained subject.